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ABSTRACT

This study examined and compared learning style differences between students who were registered nurses working for a bachelor's degree and generic student nurses who were working for a nursing degree as well as a bachelor's degree. The population surveyed included all registered nursing students and a selected number of generic student nurses (126 total subjects). The study controlled for level of program (upper division), sex (female), and educational and work experience (registered nursing students must have received their basic preparation in diploma schools of nursing and generic student nurses must have had a minimum of one year's health and/or nursing work experience). The instrument used was the Learning Style Inventory developed by David Kolb to measure individual learning styles derived from experiential learning theory. Data were analyzed by analysis of variance, repeated measures design. Findings indicated that the groups were similar in learning styles. Registered nursing students and generic student nurses more closely resembled each other as they progressed from junior to senior level. As seniors, both groups tended to become more able to learn by a variety of methods rather than by assuming a permanent learning style. Results of data analyses support similarity rather than diversity of course design as an acceptable base upon which curriculum designed for the education of both types of students can be developed. (Author/KC)

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LEARNING STYLE DIFFERENCES: REGISTERED NURSE STUDENTS VS. GENERIC STUDENT NURSES AT THE BACCALAUREATE LEVEL

by

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BACKGROUND FOR THE STUDY

With the publication of the 1965 Position Paper (American Nurses Association, 1965), the A.N.A. proclaimed its concern with the nature of nursing practice and the education necessary for such practice. Since the publication of that controversial statement, nurse educators have moved to operationalize the major objective of placing all preparatory nursing programs into institutions of higher learning within the general system of education.

The 1985 target date has been well established by the American Nurses Association and supported by the National League for Nursing, as the year by which time a baccalaureate degree will represent the minimal educational requirement for licensure as a professional nurse. Concern over the increasing numbers of Registered Nurse students enrolled in baccalaureate nursing programs has motivated attention in the literature to different modes of instruction and evaluation. For example, Competency Based Education as described by del Bueno (1978) acknowledges the importance of recognizing adult developmental needs. It is known that these needs influence the way in which adults learn. Malcolm Knowles (1978) speaks of the increasing evolution of a scientific body of knowledge concerning developmental needs from adolescense through retirement.

STATEMENT OF THE PROBLEM

This study examined and compared learning style differences as measured by the Learning Style Inventory (LSI) between Registered Nurse students and generic student nurses enrolled in a baccalaureate nursing program. The LSI, developed by Kolb (1976) attempts to categorize an individual's primary learning style according to the relative emphasis placed upon four different kinds of abilities: Concrete Experience abilities (CE), Reflective Observation abilities (RO), Abstract Conceptualization abilities (AC), and Active Experimentation abilities (AE). Further, Kolb maintains that each learner must continually choose among those learning abilities which he or she is to bring into consciousness in any learning situation. Depending upon the primary category of abilities most often implemented, four statistically dominant types of learning styles are identified. These are: (1) the Converger, (2), the Diverger, (3) the Assimilator and (4) the Accommodator.

The following brief descriptions of these four learning styles is from the LSI Manual (Kolb, 1976, pp. 5-6).

> The Converger's dominant learning abilities are Abstract Conceptualization (AC) and Active Experimentation (AE). His greatest strength lies in the practical application of ideas.
>
> The Diverger has learning strengths opposite to those of the Converger. He is best at

Concrete Experience (CE) and Reflective Observation (RO). His greatest strength lies in his imaginative ability. He excels in his ability to view concrete situations from many perspectives and to organize many relationships into a meaningful "gestalt."

The Assimilator's dominant learning abilities are Abstract Conceptualization (AC) and Reflective Observation (RO). His greatest strength lies in his ability to create theoretical models.

The Accommodator has strengths opposite to those of the Assimilator. He is best at Concrete Experience (CE) and Active Experimentation (AE). His greatest strength lies in doing things . . . He is more of a risk-taker. . . he adapts himself to specific immediate situations.

DEFINITION OF TERMS

Registered Nurse Student: Any female student entering the baccalaureate program with an active license to practice as a registered nurse, who has been educated in a diploma program and who has had a minimum of one year's experience in professional nursing practice.

Generic Student Nurse (with related health and/or nursing work experience): Any female student nurse who is not a registered nurse and who entered the baccalaureate nursing program without post-High School education but with some related health and/or nursing work experience. Such experience may include but is not limited to: nurse aide, medical corps, medical technician, lab technician, nursing home work and home health aide.

Generic Student Nurse (without related health and/or nursing work experience): Any female student nurse who is not a registered nurse and who entered the baccalaureate program without post-High School education and without related health and/or nursing work experience.

Learning Style: Defined according to Kolb (1976) and measured on the Learning Style Inventory (LSI) according to six categories which are derived from the following learning modes: Concrete Experience (CE), Reflective Observation (RO), Abstract Conceptualization (AC), Active Experimentation (AE), Abstractness over Concreteness (AC-CE) and Action over Reflection (AE-RO).

Compressability of Learning Style: The tendency of groups of students to more closely resemble each other in this respect as they progress from Junior to Senior level within the nursing program.

LITERATURE REVIEW

Specific studies of adult Registered Nurse learning style are limited. However, the returning Registered Nurse is a subject frequently addressed by current nursing journals. Literature is replete with reports surrounding the controversy about the profession's present firm stand with regard to the baccalaureate degree as a minimum requirement for entry into nursing practice. Muzio and Ohashi (1979) conclude that the generic model for baccalaureate education is not appropriate for Registered Nurses because of the many differences in their kinds of learning experiences. Registered Nurses are reluctant to repeat low-level clinical courses designed for non-experienced generic students. A review of the literature readily identifies for the nurse educator, the importance of recognizing the characteristics of this special group of students. This study deals with the identification of some of the characteristics which reflect learning style in this most important group.

In a study of prediction of success following graduation from collegiate programs, Schwirian and Gortner (1979) found that high-predictor schools had well-developed programs for "career-development students," that is, adult students. Registered Nurses comprised one category in this group. These were not accelerated programs, but enrichment programs designed to make use of background experience.

Wilson and Levy (1978) presented evidence regarding the discontent and disillusionment of Registered Nurse students who returned to school to find themselves grouped in a traditional generic class.

A question of major concern throughout the literature deals with what kinds of programs nurse educators should be designing in order to accommodate the special needs of Registered Nurse students. One such program is the New York Regents' External Degree in Nursing, developed by Carrie Lenburg (1975), a major promotor of non-traditional nursing education. Various other teaching techniques as for example, Computer-Assisted Instruction, television and videotapes allowing students to progress in their own learning according to their pace, seem to be more readily recognized in disciplines other than nursing (Huckaby, Anderson, Holm and Lee, 1979).

Plovnick (1975) reported that it was possible to accurately predict the type of medical practice that students would enter by knowing their learning styles. Chartres (1970) applied experiential learning theory and the LSI to research dealing with the professional development of nurse practitioners. Although dealing with a different population of health care providers, both of these studies address the importance of learning theory and learning styles as educators attempt to increase the depth of their understanding of the characteristics of the pre-professional students they serve.

Gott (1982), Martins (1981), Ortenzio (1982), Wolf (1982), and Jones (1981) all address the importance of attention to self-directed learning in all aspects of nursing education. Thus it becomes apparent that attention to modes of learning is of continuing significance to nurse educators.

THEORETICAL RATIONALE

Cyril Houle (1976) a leading adult education theorist, upon whose work this study was based, describes adult education as a process by which adults, experienced in life and in their respective working fields, attempt to improve themselves by increasing their skill, knowledge and sensitivity. His Fundamental System, describing decision points and components of an adult educational framework (Houle, 1976, p. 47), excludes authoritative teaching which is traditionally pedagogical rather than andragogical and is the foundation upon which a philosophy of education which emphasizes attention to teaching-learning modes is based. Throughout Houle's work, run the threads of self-direction, motivation, experiential learning and the importance of concrete experiences. These key concepts are also defined in the experiential learning model upon which the LSI is based. It is essential to study the degree to which these factors exist in the student population of interest for the purpose of determining how these students are likely to learn content best in professional nursing education. Learning experiences can be planned to avoid conflict in patterns of teaching and learning. This is particularly important since our present educational design has been developed along traditional pedagogical, adolescent-related patterns of expected reactive, rather than proactive learning.

This study was based on the premise that student preference for learning style, considered within the larger context of student objectives for seeking a baccalaureate degree, may have an influence upon the learning

that takes place within a given teaching-learning environment. Moreover, awareness of student differences along those dimensions of learning style which affect them may lead to a more effective and relevant course and courriculum design.

A synthesis of the work of other researchers including Price (1967), Kidd (1959), Lambertsen (1958), Chartres (1970), Tetrault (1976), Kuramoto (1975), Jacobs (1976) and Norris (1980), yields data on similar aspects of Registered Nurse-oriented collegiate programs, implying the importance of attention to learning modes and teacher-learner interaction. However, there is a lack of available research data which might confirm the nature of significant differences in these factors between Registered Nurses and others.

SAMPLING

The population of interest is composed of Registered Nurse students and Generic student nurses currently enrolled in baccalaureate nursing programs in New England. A representative baccalaureate program was selected from among those with a high number of Registered Nurse students. All Junior and Senior Registered Nurse students, and a comparable number of Generic student nurses were surveyed with the LSI.

Table 1, Distribution of Enrollment: The Sample summarizes enrollment data within the program surveyed in 1980, the year in which the data were collected.

Table 1

Distribution of Enrollment: The Sample

	Generic Senior		Generic Junior		R.N. Senior	R.N. Junior
Total Enrollment	105		138		39	31
No. of Subjects Meeting Selected Criteria	*with exp. 40	without exp. 30	*with exp. 50	without exp. 25	basic ed: diploma 1 yr. minimum prof. work exp. 31	27
No. Surveys Returned from Selected Subjects	17	17	27	18	20	27
Percent of Surveys Returned from Selected Subjects	42.5	56.6	54	72	64.1	100
Research Sample	N = 17	N = 17	N = 27	N = 18	N = 20	N = 27

*related health and/or nursing work experience

RESEARCH DESIGN

The design of this descriptive study required six groups of subjects, namely: (1) Registered Nurse students (Junior) and (2) Registered Nurse students (Senior), all of whom have had a minimum of one year's experience in professional nursing practice; (3) Generic student nurses (Junior) and (4) Generic student nurses (Senior) with some related health and/or nursing work experience; (5) Generic student nurses (Junior) and (6) Generic student nurses (Senior) without such related health and/or nursing work experience. These students were asked to respond to the Learning Style Inventory.

Each group studied constituted an independent variable, providing six independent samples. The dependent variables were the Learning Styles, specifically defined by Kolb as Accommodator, Diverger, Converger Assimilator, Abstract vs. Concrete and Active vs. Reflective.

HYPOTHESES STATED IN NULL FORM

Seven null hypotheses were designed:

1. There is no difference between program types (Registered Nurse-Generic) with respect to LSI scores.

2. There is no difference between class levels (Junior-Senior) with and without related health and/or nursing work experience with respect to LSI scores.

3. There is no interaction between program type (Registered Nurse-Generic) and class level (Junior-Senior) with respect to LSI scores.

4. There is no difference among the 6 LSI scores.

5. There is no interaction between program type (Registered Nurse-Generic) and the six LSI scores.

6. There is no interaction between class level (Junior-Senior) and the six LSI scores.

7. There is no interaction among LSI scores, program type and class level.

STATISTICAL PROCEDURES

Data were analyzed by analysis of variance - repeated measures design: Using the LSI instrument, a 2 X 2 X 6 repeated measures design tested for the null hypotheses.

Resulting raw scores were converted to standardized Z scores. Separate ANOVA procedures were used to test for the significance of experience within the Junior and Senior classes with respect to LSI scores.

RESULTS OF THE STUDY

Using both raw and Z scores, an initial ANOVA procedure, Group by Year by LSI scale scores produced significant results. Table 2, Summary of LSI Standardized Scores, Group by Year by LSI presents that data.

A second procedure, using standardized scores also produced a significant f for the same measures, as presented in Table 3, Summary of LSI Standardized Scores, Group by Year by LSI Scores.

Since the LSI is actually composed of four primary scales and two composite scales, a third computation was sought, using Group, Year and the four raw LSI scores as the classifying factors. Again, a significant f was generated for the classifying factor, Year. Table 4, Source Table, LSI Raw Scores: Four Levels, presents these data.

A fourth procedure was then accomplished, using the two composite scores as dependent variables, with the same measures, Group by Year by LSI. These data are presented in Table 5, Source Table, Group by Year by LSI: Two Composite Scores.

Table 6, Summary: Significant Main Effects - LSI as Dependent Variable, summarizes the total significant findings of these analyses.

In order to gain a clearer picture of typical learning styles observed in each major group of subjects, composites were graphed using Z scores derived from the original analyses. Among the most significant differences were those noted between R.N. Senior and Generic Senior as shown in Figure 1, Registered Nurse Senior, Generic Senior Learning Style and Type Grid.

Summary Data is presented in Figure 2, LSI Scores (6) (4) (2) Group by Year with P Values.

Figure 1

Registered Nurse Senior

Generic Senior
Learning Style Type Grid

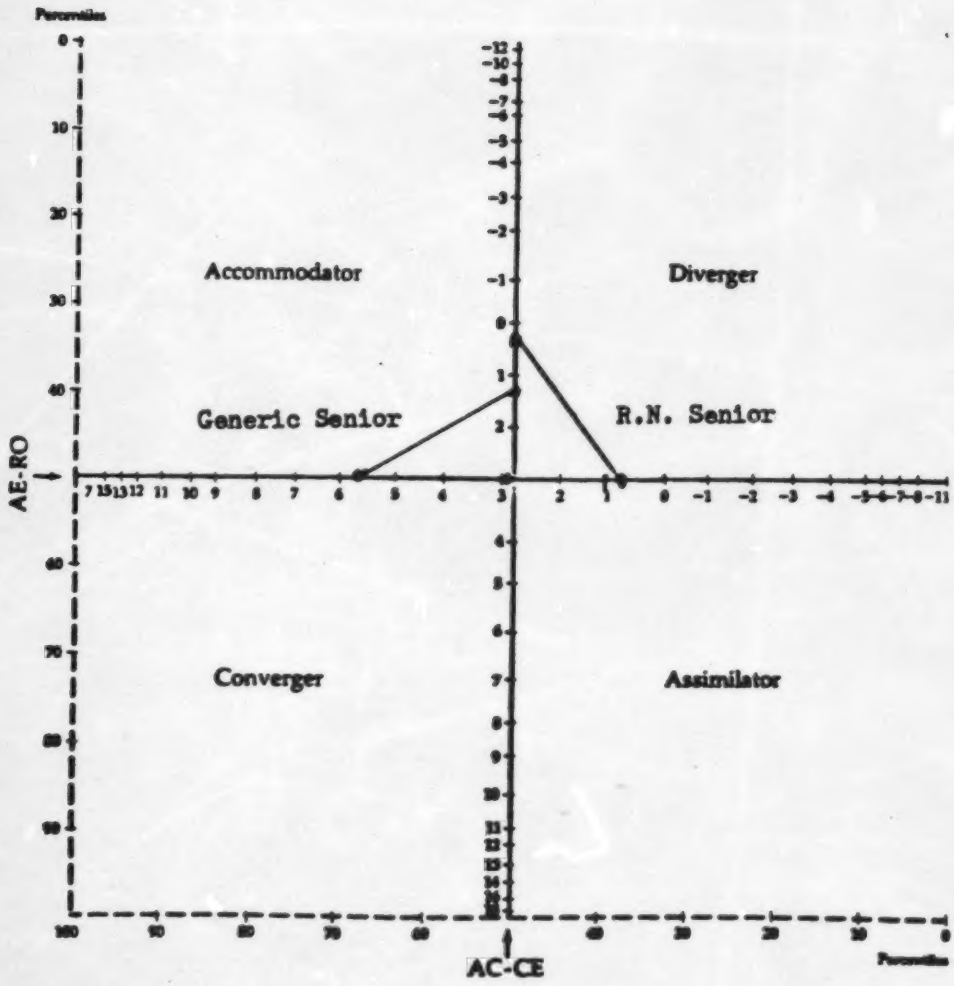
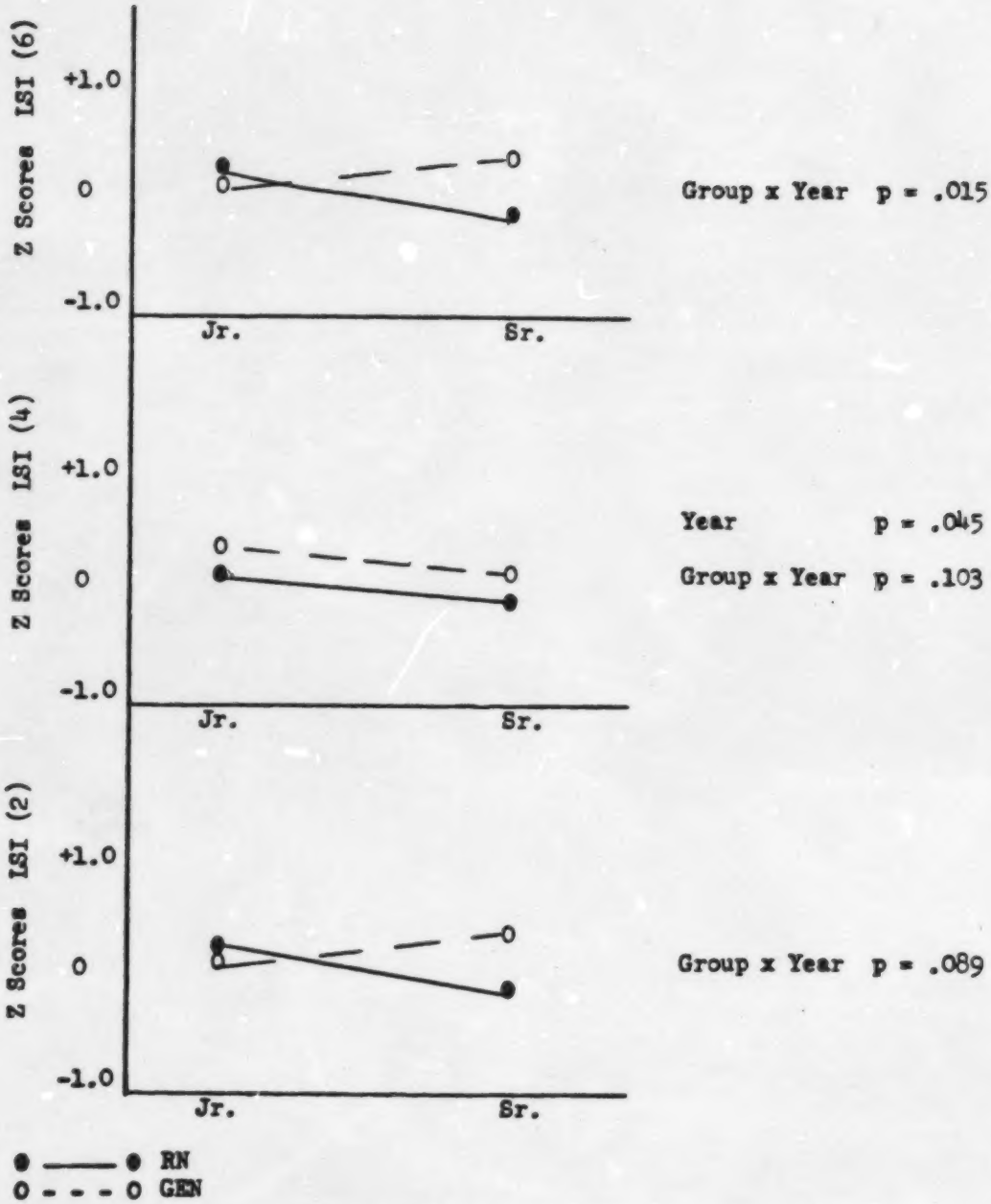


Figure 2

LSI Scores (6) (4) (2)

Group x Year with P Values



Note: As Juniors, Subsets Appear To Be Similar In LSI Scores. As Seniors, There Is Moderate Evidence For Divergence:
Generic = Accommodators R.N. = Divergers

Table 2

Summary of LSI Scale Scores, Group by Year by LSI

Source	Sum of Squares	DF	Mean Square	F-Test	Significance	Percent of Total Sum of Squares
Group	31.090	1	31.090	2.261	0.136	0.07
Year	26.098	1	26.098	1.898	0.171	0.06
Group x Year	79.692	1	79.692	5.796	0.018	0.19
Unit	1663.586	121				3.97
LSI	29865.688	5	5973.137	358.579	under .001	71.18
Group x LSI	122.172	5	24.434	1.471	.198	0.29
Year x LSI	37.626	5	7.525	.453	over .500	0.09
Group x Year x LSI	80.212	5	16.042	.966	.439	0.19
LSI x Unit	10049.953	605	6.611			23.95
						100.00

Table 3

Summary of LSI Z Scores, Group by Year by LSI

Source	Sum of Squares	DF	Mean Square	F-Test	Significance	Percent of Total Sum of Squares
Group	1.764	1	1.764	2.180	0.143	0.23
Year	2.421	1	2.421	2.993	0.087	0.32
Group x Year	4.939	1	4.939	6.106	0.015	0.66
Unit	97.874	121	0.809			13.00
LSI	0.569	5	0.114	0.109	over 0.500	0.08
Group x LSI	8.155	5	1.631	1.569	0.167	1.08
Year x LSI	2.762	5	0.552	0.531	over 0.500	0.37
Group x Year x LSI	5.382	5	1.076	1.036	0.396	0.72
LSI x Unit	628.903	605	1.040			83.55
						100.00

Table 4

Source Table, LSI Raw Scores: Four Levels

Source	Sum of Squares	DF	Mean Square	F-Test	Significance	Percent of Total Sum of Squares
Group	2.938	1	2.938	.349	over 0.5	.05
Year	34.106	1	34.106	4.049	0.047	.59
Group x Year	19.672	1	19.672	2.336	0.130	.34
Unit	1019.125	121	8.423			17.54
LSI	487.087	3	162.362	14.344	under 0.001	8.38
Group x LSI	73.584	3	24.528	2.167	0.092	1.27
Year x LSI	12.841	3	4.280	0.378	over 0.500	.22
Group x Year x LSI	53.140	3	17.713	1.565	0.198	.91
LSI x Unit	4108.734	363	11.319			70.70

Table 5

Source Table: Group by Year by LSI: 2 Composite Scores

Source	Sum of Squares	DF	Mean Square	F-Test	Significance	Percent of Total Sum of Squares
Group	2.054	1	2.054	1.906	0.171	0.82
Year	0.021	1	0.021	0.019	over 0.500	0.01
Group x Year	3.187	1	3.187	2.957	0.089	1.27
Unit	130.428	121	1.078			51.99
LSI	0.121	1	0.121	0.129	over 0.500	0.05
Group x LSI	1.017	1	1.017	1.086	0.300	0.41
Year x LSI	0.619	1	0.169	0.661	0.418	0.25
Group x Year x LSI	0.147	1	0.147	0.157	over 0.500	0.06
LSI x Unit	113.284	121	0.936			45.15

Table 6

Summary: Significant Main Effects
LSI as Dependent Variable

Effects	Dependent Variable	Alpha	Type of Score
Group x Year	LSI (6)	p = .015	Z Scores
Year	LSI (6)	p = .087	Z Scores
Year	LSI (4)	p = .047	Raw Scores
Group x LSI	LSI (4)	p = .092	Raw Scores
Year	LSI (4)	p = .045	Z Scores
Group x Year	LSI (4)	p = .103	Z Scores
Group x LSI	LSI (4)	p = .111	Z Scores
Group x Year	LSI (2)	p = .092	Raw Scores
Group x Year	LSI (2)	p = .089	Z Scores
Year x Exp. x LSI	LSI (2)	p = .089	Raw Scores
Year x Exp. x LSI	LSI (2)	p = .093	Z Scores

In summary, it appeared that all students seemed to move in the direction of diversity of learning style. Compressability of data, that is, a general over-all movement toward the middle ground of the LSI scales may indicate that all students tend to learn by a variety of methods adapting to the circumstances in which they find themselves during each learning experience. It appeared that the percent is less than five in one hundred that this would occur by chance alone.

Data obtained permitted rejection of the null hypotheses although only marginally significant f values were generated. The need for replication with larger samples is recognized.

Implications for course and curriculum design may lie in the development of awareness on the part of educators that provision should be assured for sequential learning, perhaps self-paced, whereby each student may be free to apply a variety of learning techniques to achieve the stated objectives of the specific courses. Because students seem to be able to adapt their own learning styles and needs, students at the senior level particularly may be quite capable of selecting learning situations which are congruent with their individual learning styles. It would appear that Registered Nurse students and Generic student nurses may effectively be grouped together in some courses, especially at the senior level, where learning objectives and learning styles of the two groups appear to merge.

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